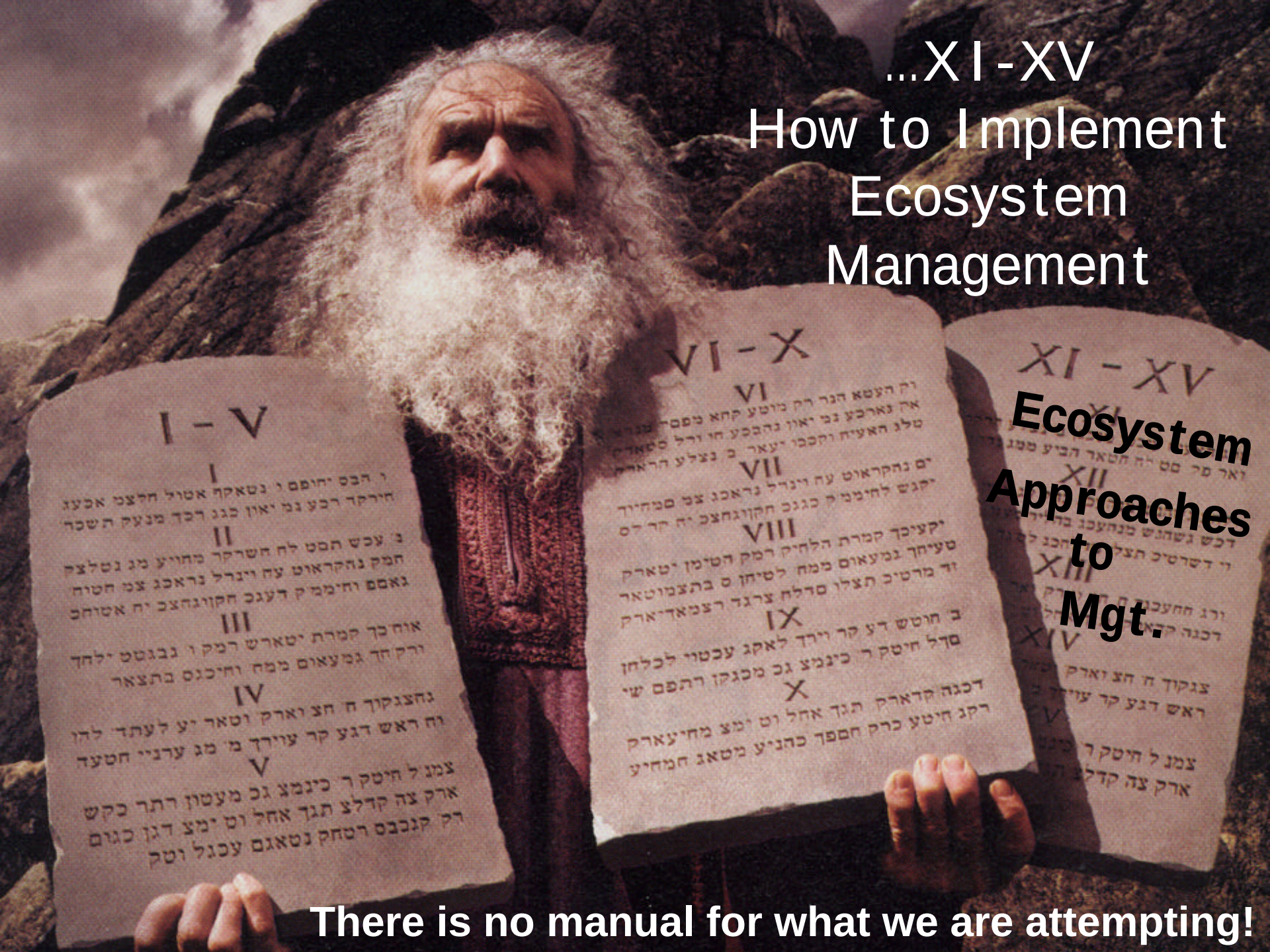
The Global Perspective & NOAA's Approach to EAM

- **Ecosystem Concepts and Implications for Organization and Governance (reflected in many places)**
- **NOAA's Initiatives Supporting Ecosystem Approaches to Science & Management (EAM)**
- **Government-Wide & NOAA (EGT) Priorities for EAM**

Steve Murawski
Chief Scientist, NOAA Fisheries Service &
Ecosystem Goal Team Lead (Acting)

Tier III Protected Resources Workshop
3/7/2006


…XI-XV
How to Implement Ecosystem Management
Ecosystem Approaches to Mgt.
There is no manual for what we are attempting!

IUCN – 12 Principles of the Ecosystem Approach*

- Objectives of land, water and LR management are a matter of societal choice
- Management should be decentralized to the lowest level possible
- Managers should consider effects on adjacent ecosystems
- Consider economic effects to:
  - reduce market distortions that adversely affect ecosystems
  - align incentives that promote biodiversity
  - internalize costs and benefits in a given ecosystem
- Conservation of ecosystem structure & function to maintain services should be a priority

*** Shepherd, 2004**

IUCNs Ecosystem Approach – cont.

- Ecosystems managed within limits of their functioning
- EA undertaken at appropriate spatial and temporal scales
- Recognizing temporal variability & lag effects, objectives should be set for the long term
- Management must recognize that change is inevitable
- EA should seek the appropriate balance between & integration of conservation and use of biodiversity
- EA should consider all forms of relevant information, including scientific and ingigenous and local knowledge
- EA should involve all relevant sectors of society & scientific disciplines

FAO – Putting into Practice the Ecosystem Approach to Fisheries – Key Research Requirements

- Ecosystem and Fishery Impact Assessments
- Socio-economic Considerations
- Assessment of Management Measures
- Assessment and Improvement of Management Measures
- Monitoring and Assessments

*** Shepherd, 2004**

Ecosystem Mandates: A Paradigm Shift or Evolution?

Current Mandates

Individual Species

Narrow Perspective & Scale

Human Activities Evaluated for Individual activities

Resource Management by Sectors

Scientific Monitoring programs Focused narrowly

Single Use and Purpose Observations

Focus on Managing Ecosystem parts

Future Mandates

Multiple Species

Broad Perspective & Scale

Humans Integral to Ecosystem

Integrated Resource Management

Adaptive Management Based On Scientific Monitoring

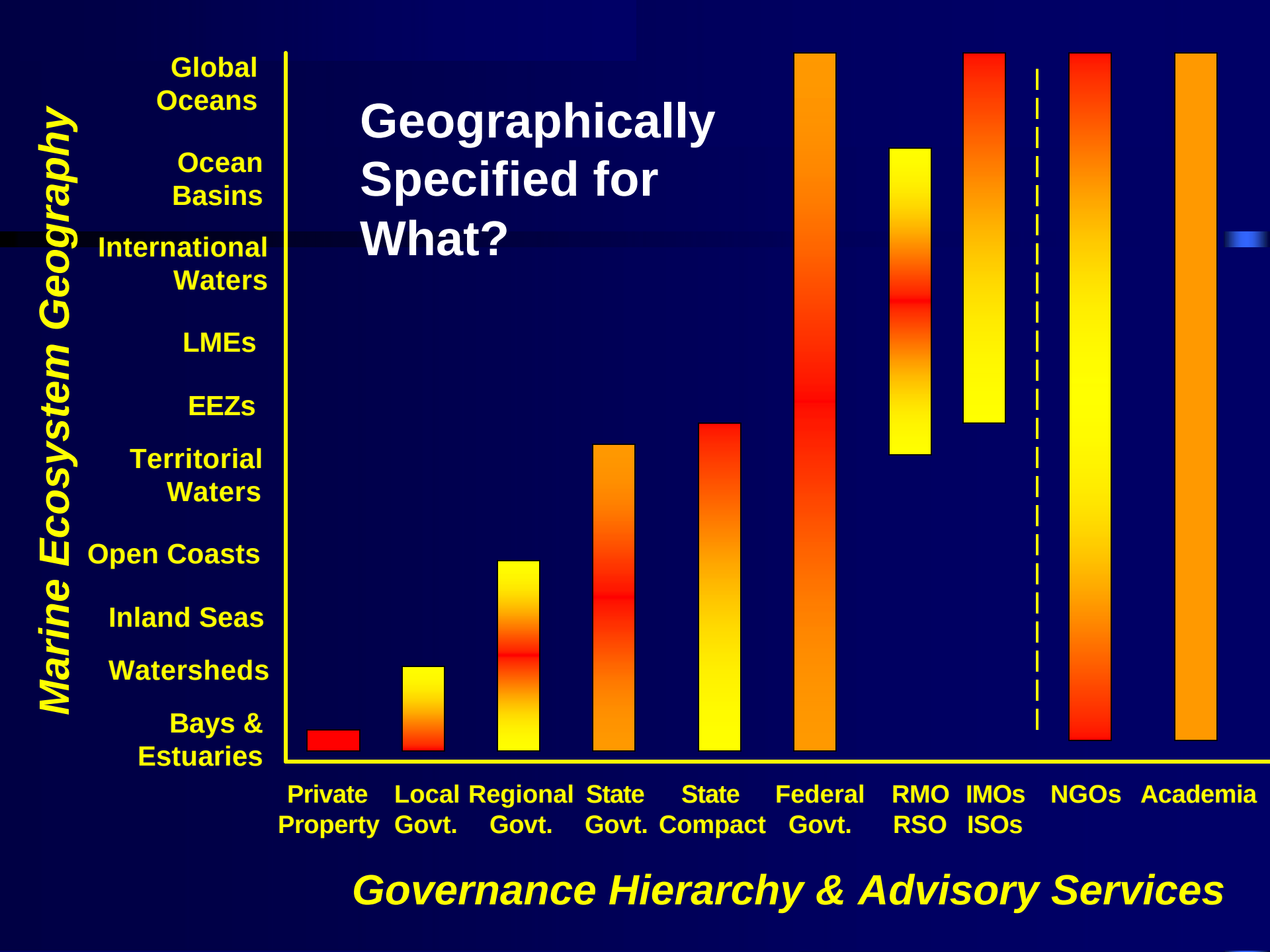
Shared and Standardized Observations

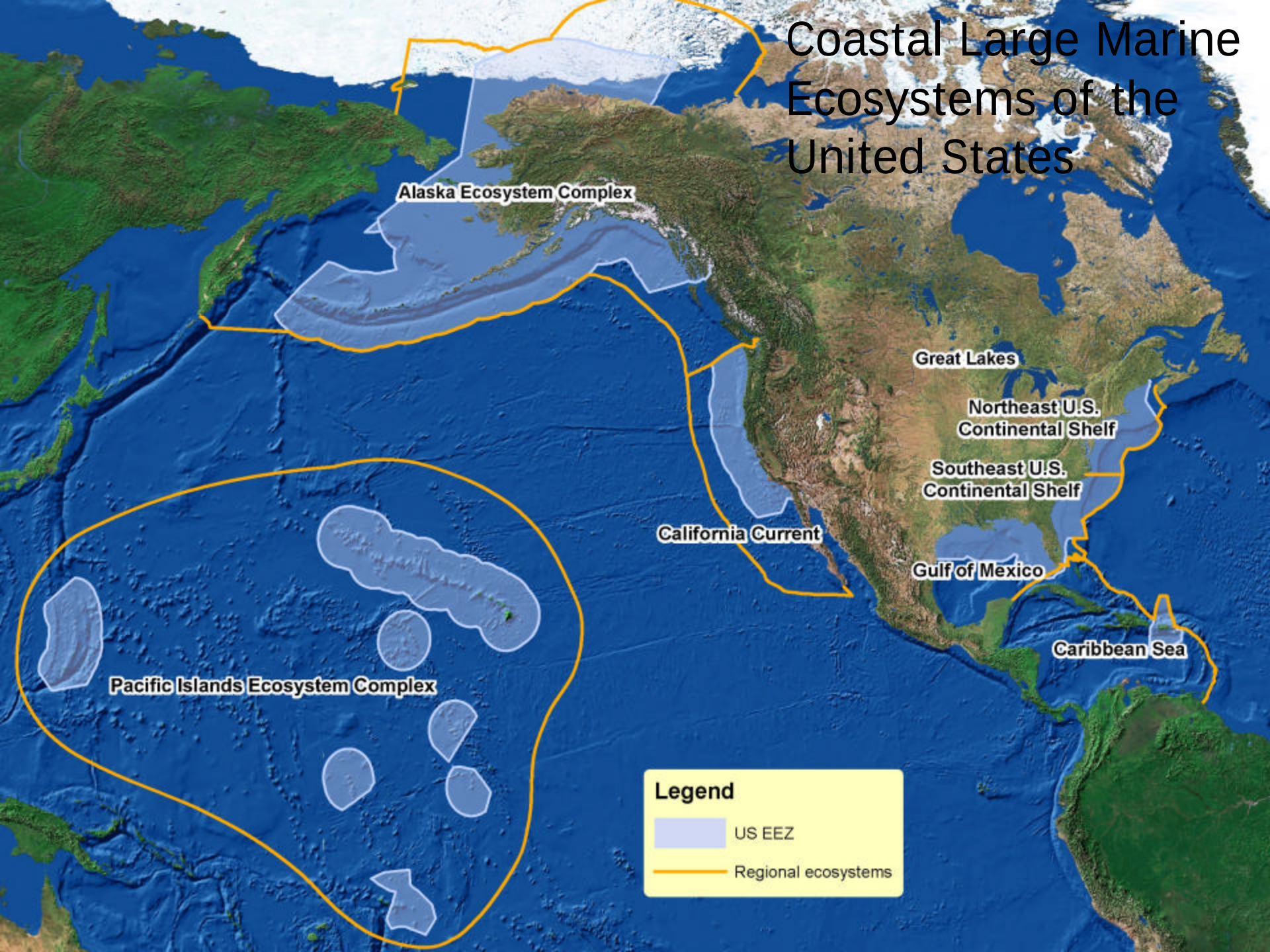
Focus on Ecosystem Relationships, Processes, and Tradeoffs

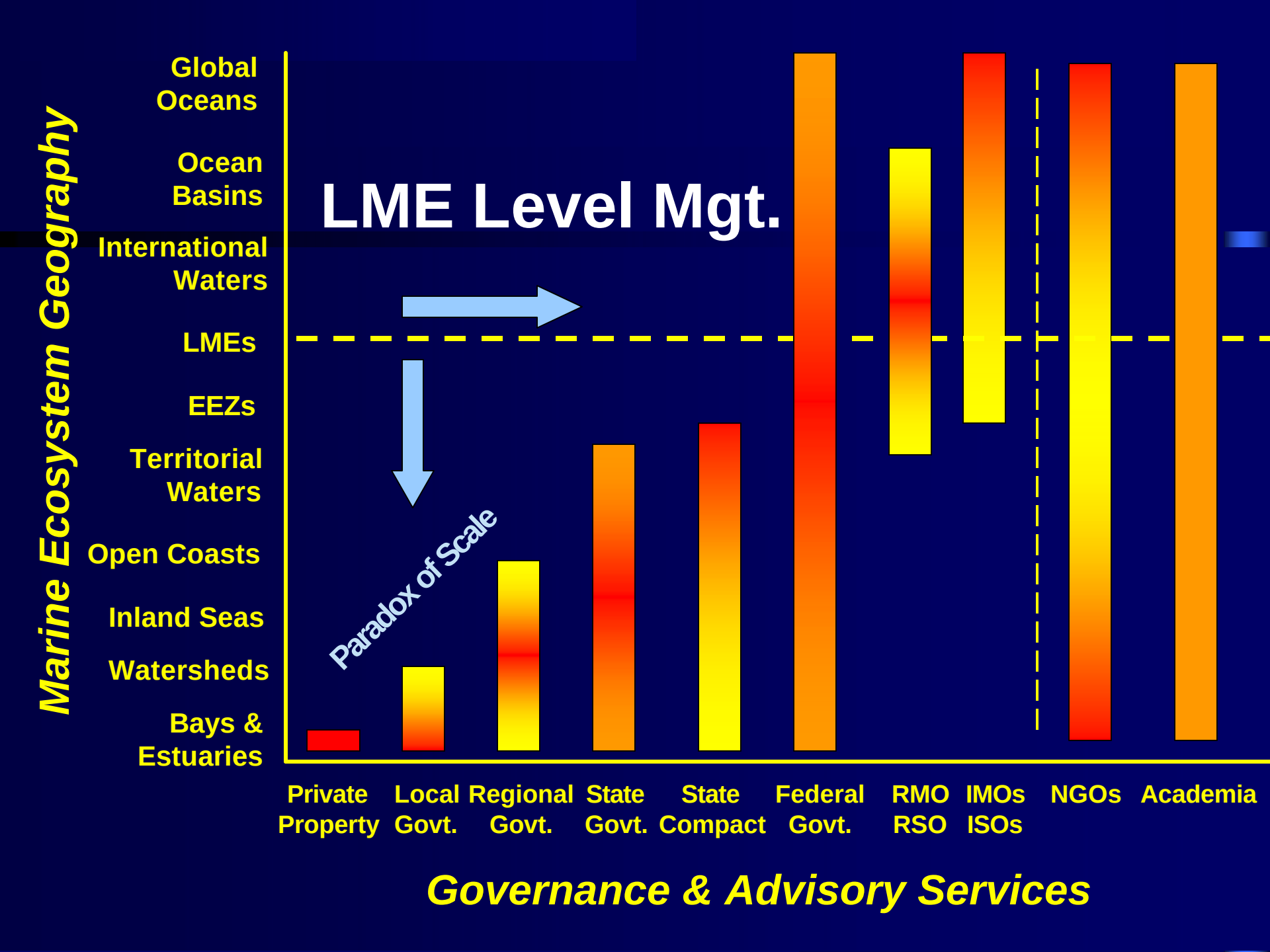
NOAA Definitions of EAM*

- **An *ecosystem* is a *geographically specified* system of organisms (including humans), the environment, and the processes that control its dynamics.**
- **Characteristics of EAM:**
  - ***geographically specified*,**
  - **adaptive,**
  - **incremental,**
  - **takes account of ecosystem**
  - **knowledge and uncertainties,**
  - **considers multiple external influences, and**
  - **strives to balance diverse social objectives**

* NOAA Ecosystem Goal Team (EGT)


Geographically Specified for What?
Marine Ecosystem Geography
Global Oceans
Ocean Basins
International Waters
LMEs
EEZs
Territorial Waters
Open Coasts
Inland Seas
Watersheds
Bays & Estuaries
Private Property
Local Govt.
Regional Govt.
State Govt.
State Compact
Federal Govt.
RMO RSO
IMOs ISOs
NGOs
Academia
Governance Hierarchy & Advisory Services


Coastal Large Marine Ecosystems of the United States
Alaska Ecosystem Complex
Great Lakes
Northeast U.S. Continental Shelf
Southeast U.S. Continental Shelf
California Current
Gulf of Mexico
Caribbean Sea
Pacific Islands Ecosystem Complex
Legend
US EEZ
Regional ecosystems


Marine Ecosystem Geography
Global Oceans
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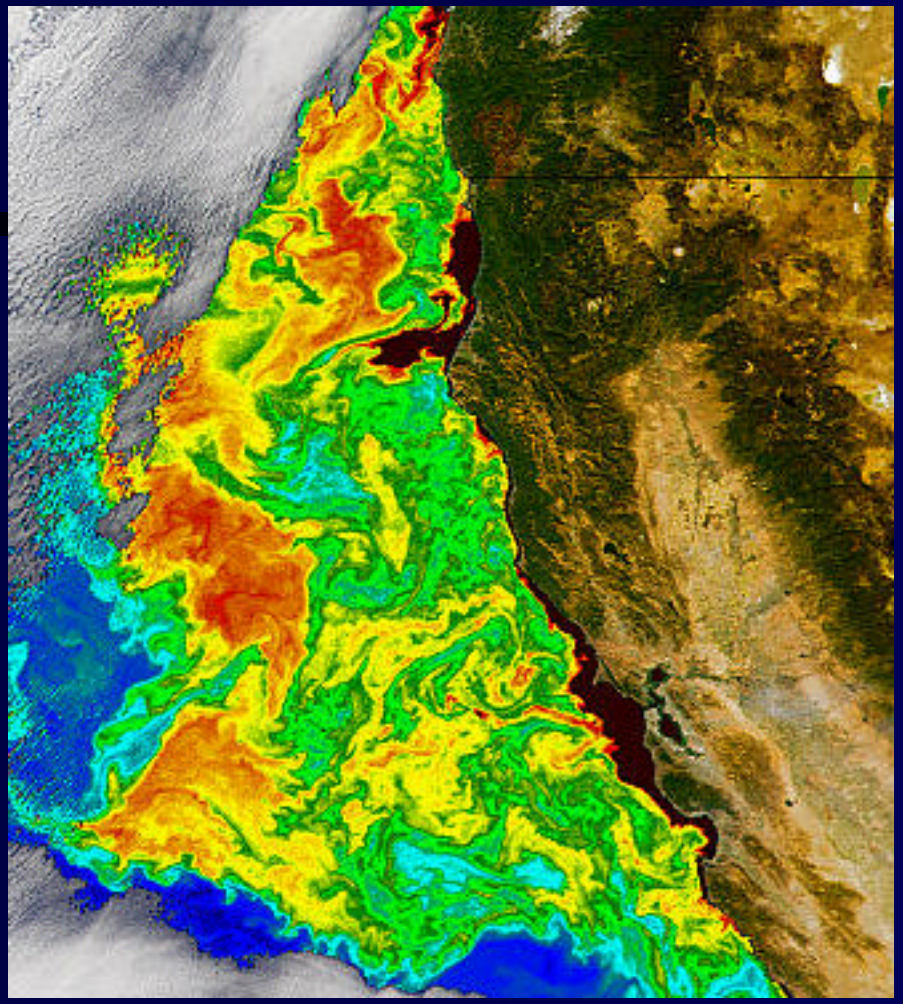
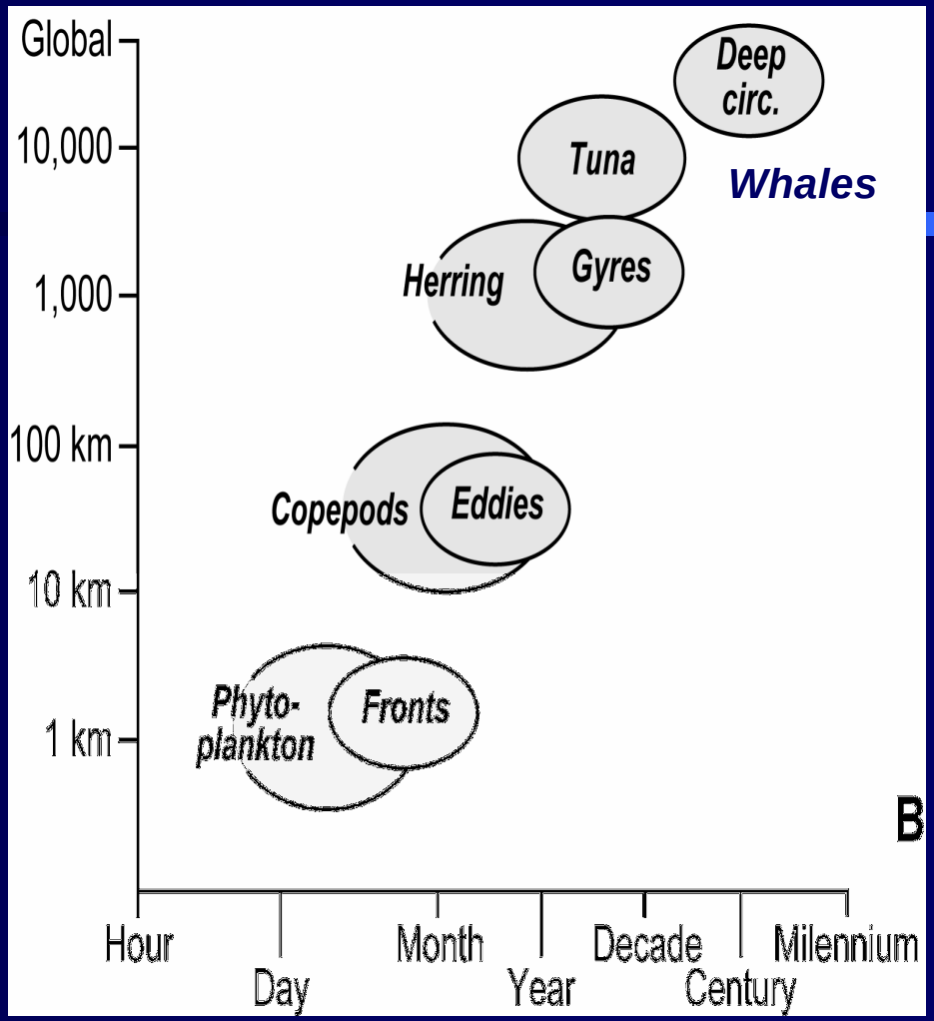
EEZs
Territorial Waters
Open Coasts
Inland Seas
Watersheds
Bays & Estuaries
LME Level Mgt.
Paradox of Scale
Private Property
Local Govt.
Regional Govt.
State Govt.
State Compact
Federal Govt.
RMO RSO
IMOs ISOs
NGOs
Academia
Governance & Advisory Services

Scales of Processes and Biota





Surface chlorophyll **Time/Space Scales**

Operational Objectives for EAM-(EAF)

(1) Develop broad Stakeholder-Based Governance system

(2) Conserve essential Parts of the ecosystem

(3) Conserve essential ecosystem Processes

Question, if (2) is done well, is (3) necessary?

Many Recent Publications Proposing General Objectives for EAM, EBM

Develop Ecosystem Governance System

- **Manage Tradeoffs**

  - among fisheries sectors, optimize fishery benefits, prevent sequential depletion/effort transfer, use management processes that are fair, equitable and transparent, consider cumulative impacts, evaluate impacts of non-fishery sectors, include diverse stakeholder views

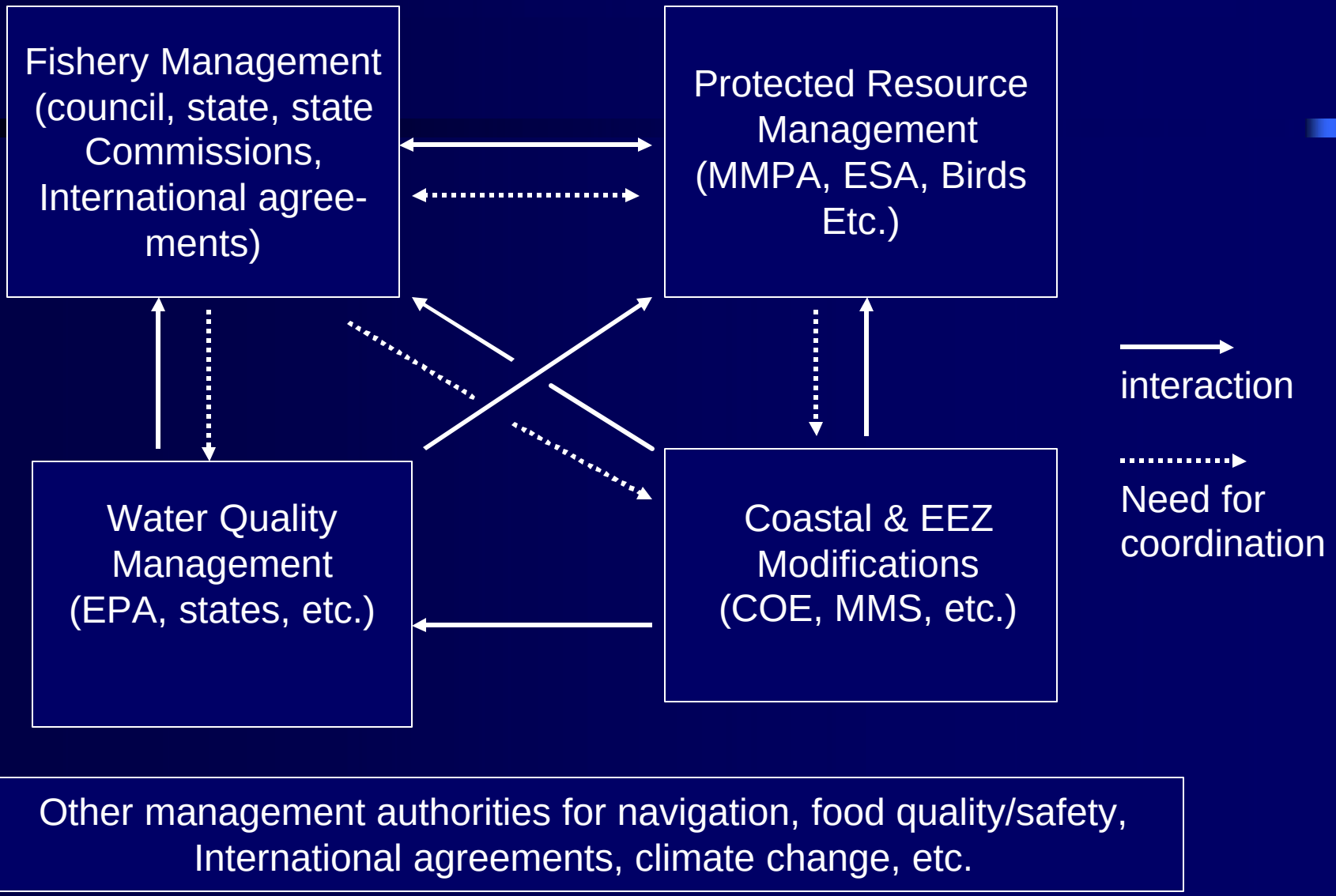
- **Use Adaptive Approaches to Management**

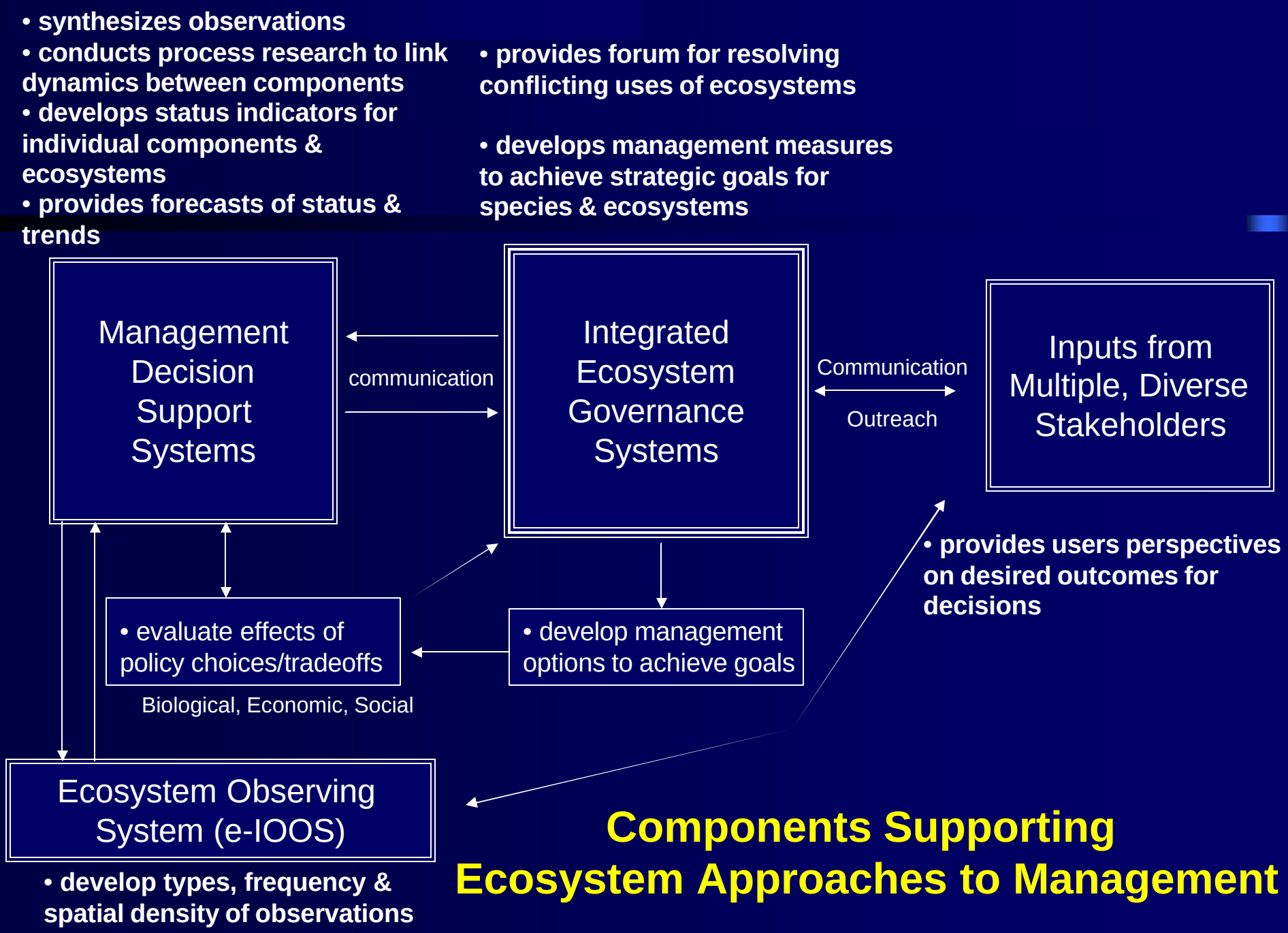
  - consider multiple causes for observed changes and sources of uncertainty in assessment & prediction, reverse burden of proof where consequences are great, imbed experiments in management approaches to increase ecosystem knowledge

- **Establish Appropriate Ecosystem Boundaries**

  - allows for interconnections between adjacent ecosystems, allows for imports and exports, includes multiple spatial scales depending on issue - paradox of scale

Elements of Regional Ecosystem Governance





Components Supporting Ecosystem Approaches to Management

Conserve & Manage Ecosystem Parts

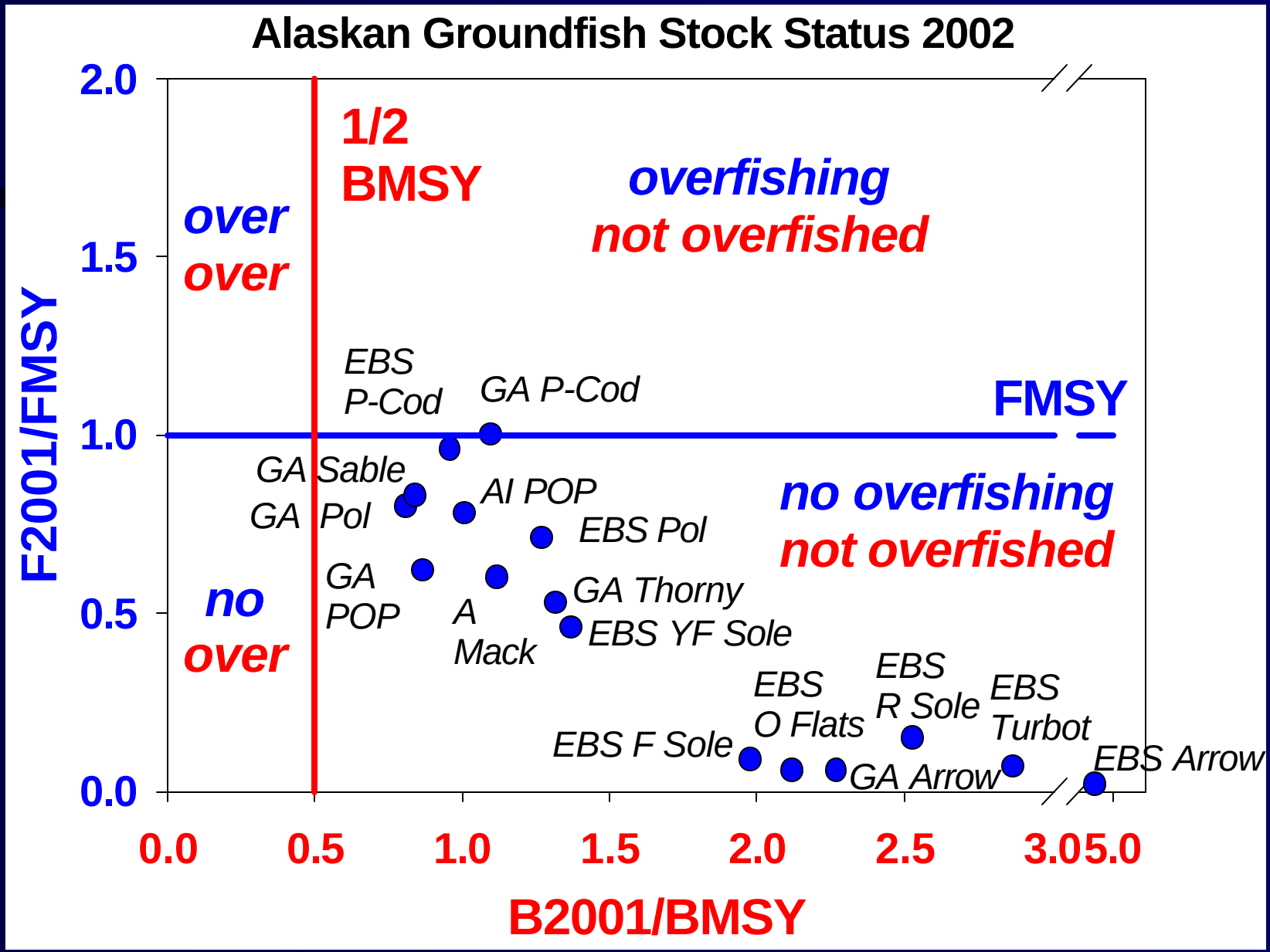
- **Conserve and Manage Species**

  - Target species, assemblages, non-target species, PET species, biodiversity protection*

- **Minimize Bycatch**

  - target, non-target & PET species, and minimize waste

*** PET = Protected, Endangered or Threatened Species**


Alaskan Groundfish Stock Status 2002
2.0
1.5
1.0
0.5
0.0
F2001/FMSY
1/2
BMSY
over
over
overfishing
not overfished
FMSY
EBS
P-Cod
GA P-Cod
GA Sable
GA Pol
AI POP
EBS Pol
no overfishing
not overfished
GA
POP
A
Mack
GA Thorny
EBS YF Sole
no
over
EBS
O Flats
EBS
R Sole
EBS
Turbot
EBS F Sole
GA Arrow
EBS Arrow
0.0
0.5
1.0
1.5
2.0
2.5
3.0
5.0
B2001/BMSY

Non-Resource Species: Barndoor Skate

Stratified Mean Number per Tow

3
2
1
0

1960 1965 1970 1975 1980 1985 1990 1995 2000 2005

Year

Account for Ecosystem Processes

- **Evaluate & Inform Feedback Effects**

  - predator-prey relationships, gear impacts on habitat productivity, irreversibility of fishing impacts, harvesting-induced regime change

- **Maintain Ecosystem Productivity, Balance Ecosystem Structure**

  - evaluate ecosystem carrying capacity, maintain resilience/resistance to perturbations, attain trophic balance

- **Account for Climate Variability**

  - low-frequency variation (decadal scale changes), High-frequency variation (year-to-year or more frequent), climate-based regime change

Ecosystem-based Management Actions

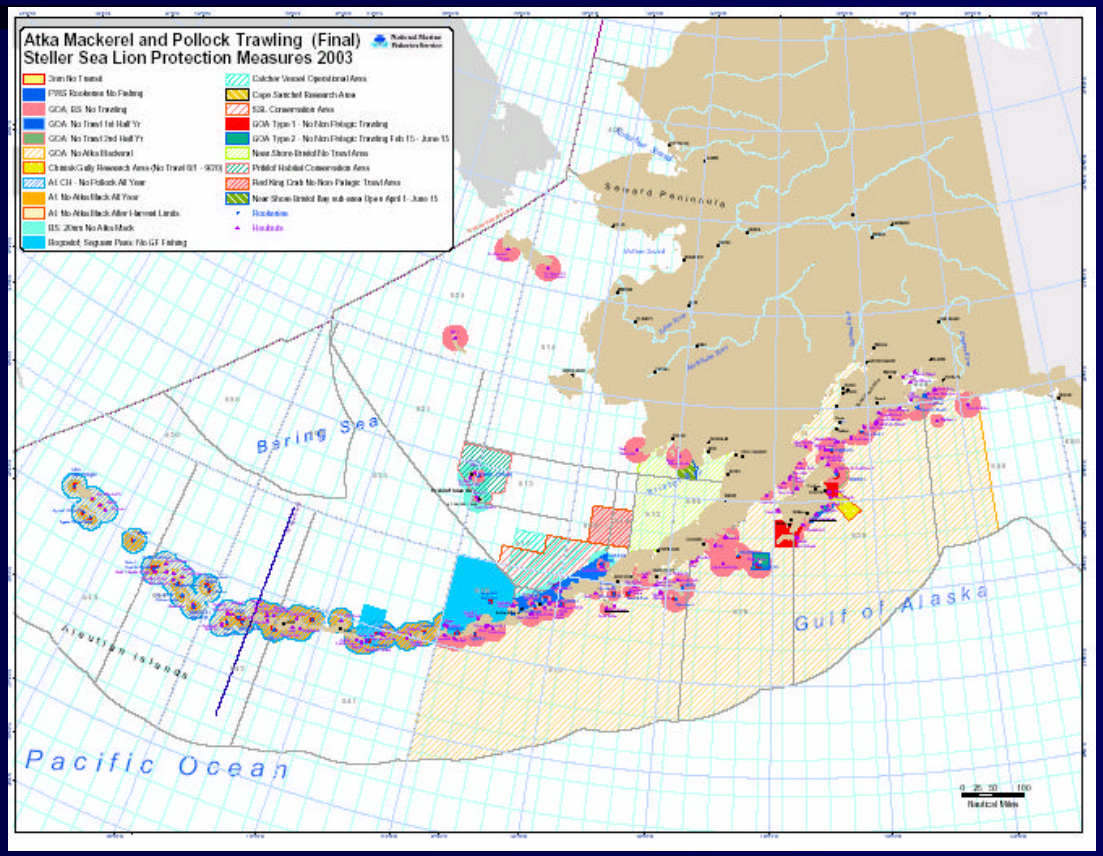
- TAC less than ABC for individual stocks.
- OY Cap on total groundfish yield.
- No target fisheries on forage species.
- Short-tailed albatross take restrictions, Seabird bycatch mitigation devices.
- No fishing in Steller sea lion foraging area and minimum biomass threshold for sea lion prey.
- Trawl closures, bottom trawling restrictions.
- Bycatch and discard controls.

CAP on TOTAL TARGET CATCH
BSAI Total Yield < 2 million mt

Catch ≤ TAC ≤ ABC < OFL

Conservative single-species targets

Steller Sea Lion Protection Measures

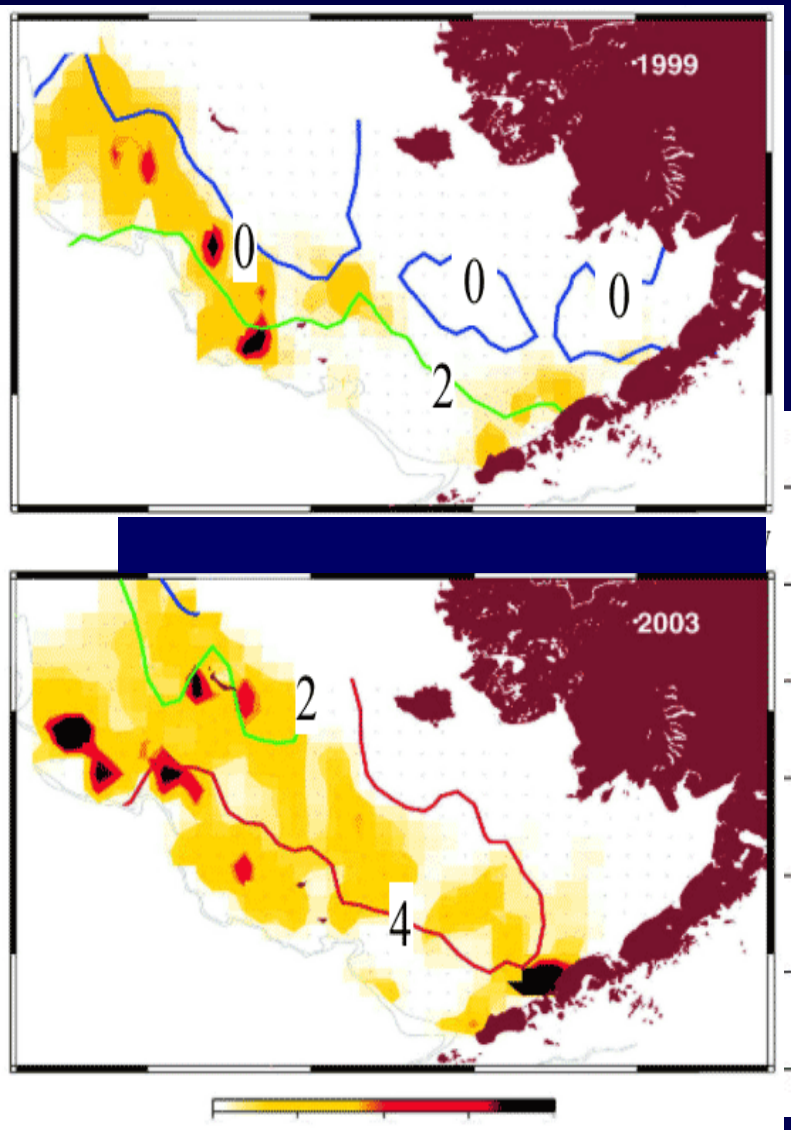


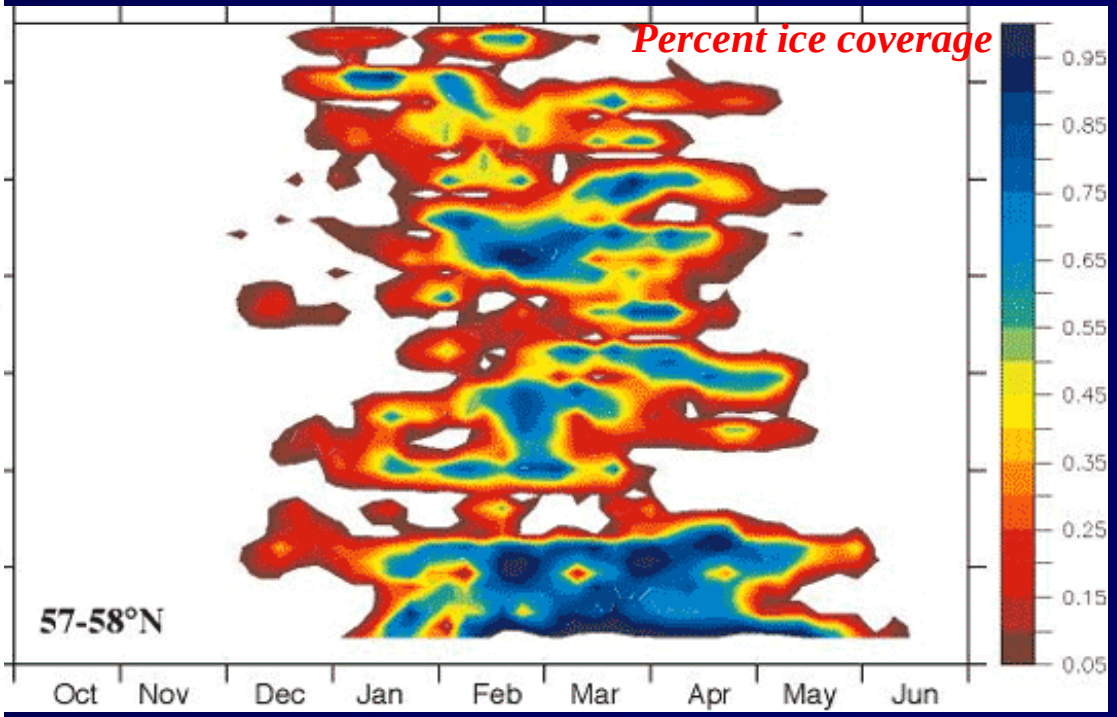
No Trawl Areas and Seasonal Closures

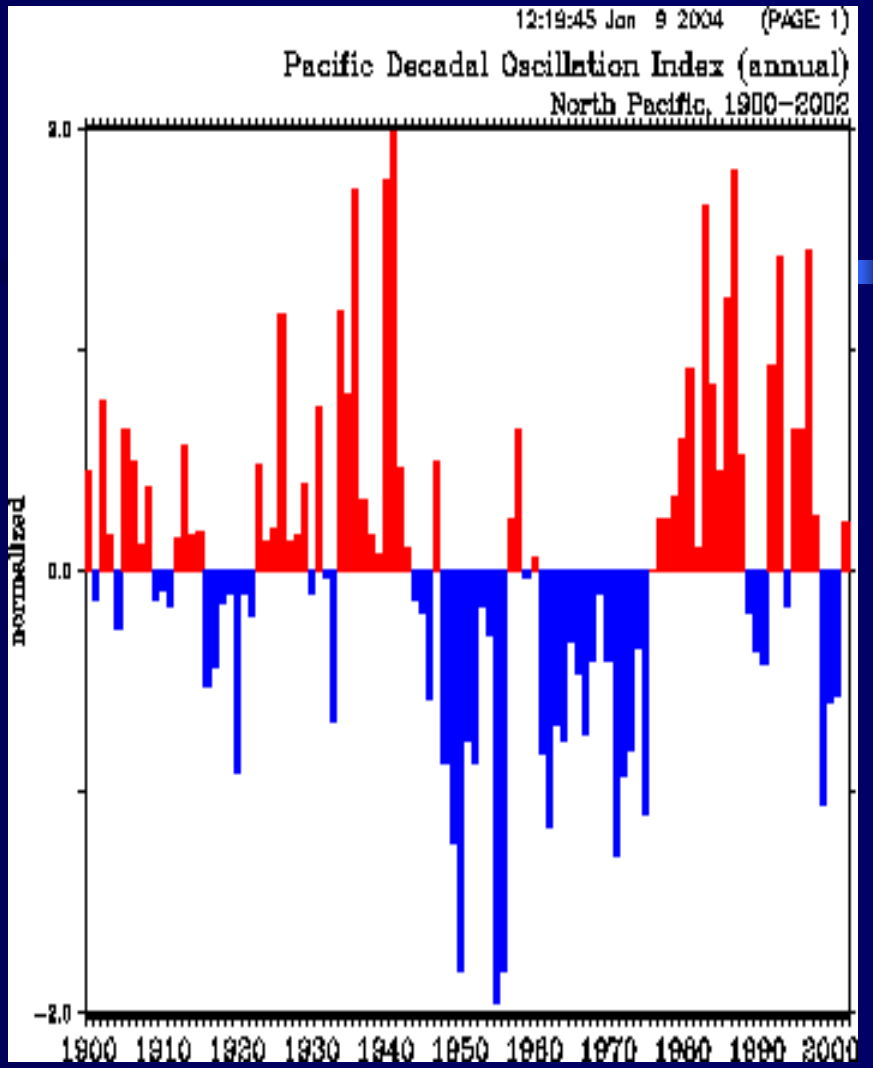
Changing climate:

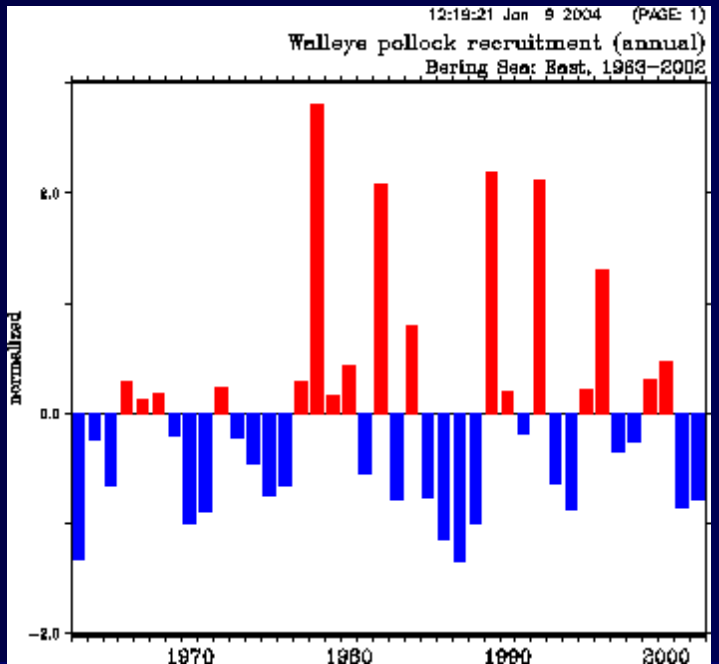
Bering Sea ice extent

and duration has changed and impacts summer distribution of pollock



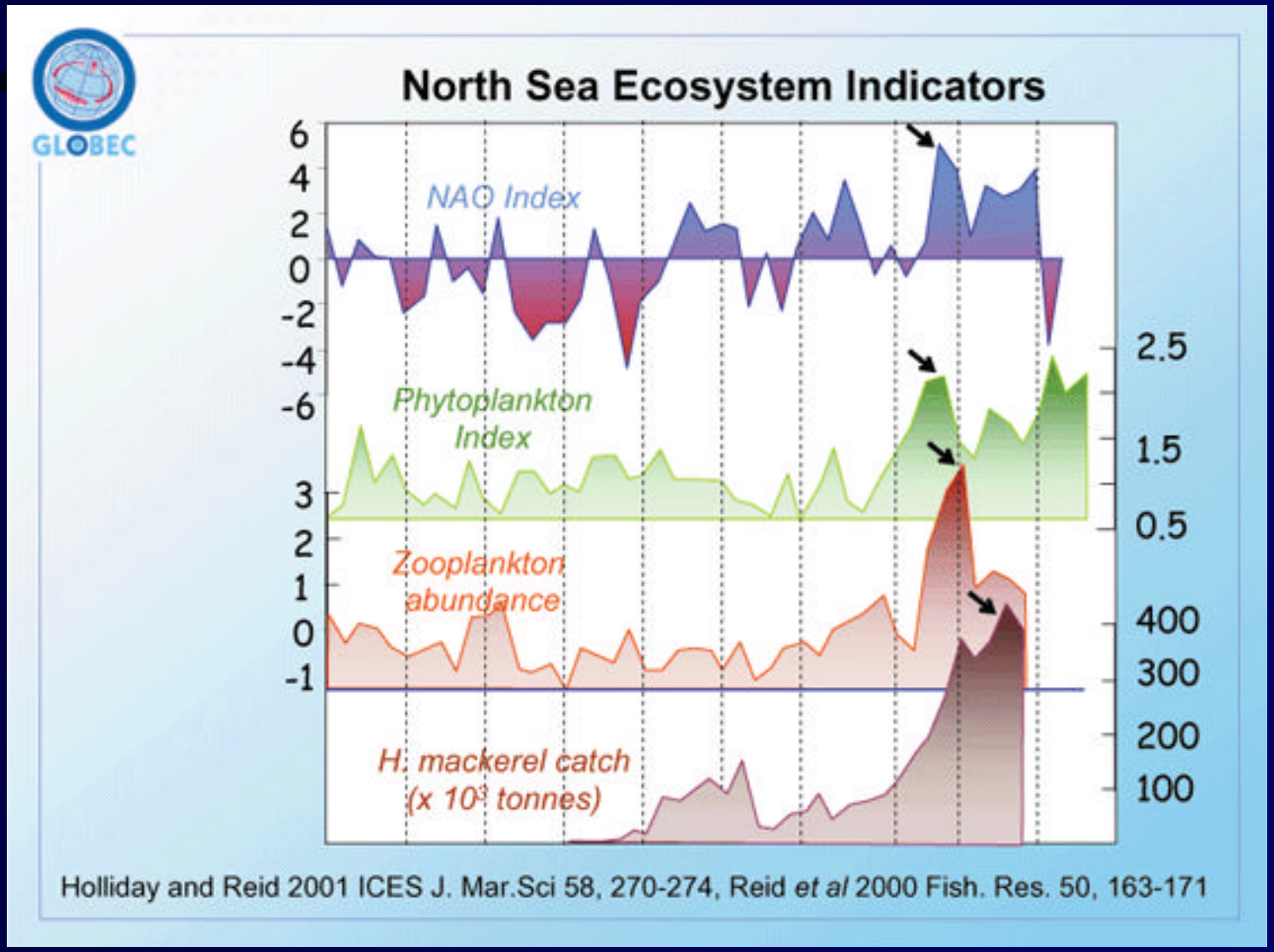




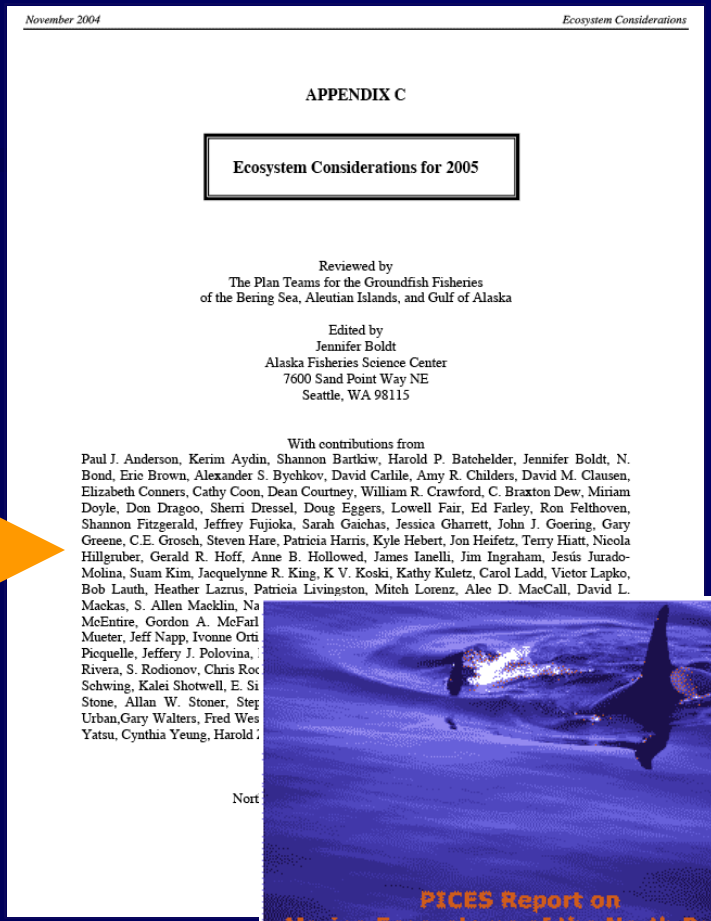


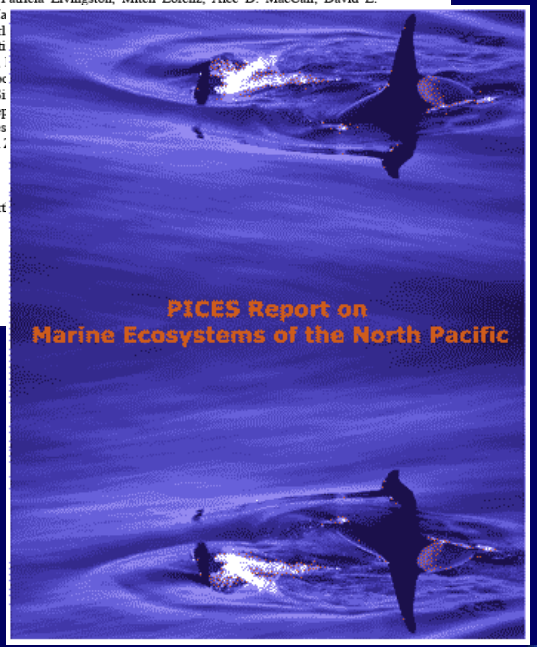
Role of Correlation: PDO & Pollock Recruitment

Physical, Biological and Social Components to produce Integrated Ecosystem Assessment



Integrated Data Products for Alaskan Ecosystems





IOOS is not Just about Sampling

Pull up Your Grades!

- EAM needed to address USOC Issues - NOAA can provide leadership to address these grades
- Some are budget, some require governance change, all require better integration

JOINT OCEAN COMMISSION INITATIVE

U.S. OCEAN POLICY REPORT CARD

2004

Subject	Grade	Comments (see full comments attached)
Initial Response To Commission Reports	A-	The President, Congress, and the Governors publicly embraced the major recommendations of the U.S. Commission on Ocean Policy and the Pew Oceans Commission. The President issued the U.S. Ocean Action Plan and established the Committee on Ocean Policy. Congress held hearings and introduced ocean-related legislation. Several Governors ini tiated regional and state strategies for coordinating ocean and coastal science and policy. These actions set high expectations for significant progress toward ocean policy reform.

2005

Subject	Grade	Comments (see full comments attached)
National Ocean Governance Reform	D+	Development of the U.S. Ocean Action Plan and establishment of the Committee on Ocean Policy are significant actions, but to date the tangible results have been limited given the scope of the challenges facing our nation. Despite pending legislation and efforts of the Committee, legislative and administrative reforms addressing organizational deficiencies in NOAA and mandatory interagency coordination and integration of ocean-related programs have been inadequate. Moreover, the steps taken to date do not embody the governance reform principles put forth by the Joint Ocean Commission Initiative.
Regional and State Ocean Governance Reform	B-	Promising ocean governance efforts are underway in a number of regions and states. The Joint Initiative encourages more regional collaboration and calls on additional states to demonstrate a commitment to ocean governance reform. The federal government should do more to facilitate and support ocean governance reform efforts in regions and states and should strive for better coordination among federal agencies at the regional level.
International Leadership	F	While some positive steps have been taken regarding international leadership on ocean issues, our continued failure to become a party to the United Nations Convention on the Law of the Sea hampers our ability to enhance and protect our national security interests and to demonstrate international leadership. Despite overwhelming support from a diverse array of interests, the Senate has yet to schedule the convention for a floor vote, and more vigorous support from the Administration is needed.
Research, Science, and Education	D	Doubling the ocean research budget and significantly increasing the support for ocean science and education are fundamental to improving our understanding and management of the oceans and coasts. The lack of an integrated ocean observing system capable of providing decision makers with important information compromises our nation's capacity to manage the oceans. The absence of an ocean and coastal stewardship ethic and a sluggish effort to coordinate the public education and outreach activities needed to enhance such an ethic hamper support for reform and funding.
Fisheries Management Reform	C+	Broad bipartisan support has been garnered for a Senate bill to reauthorize the Magnuson-Stevens Fishery Conservation and Management Act, and the Joint Initiative applauds the effort to reach out to Commissioners and other stakeholders during the development of the bill. The Joint Initiative appreciates the Administration's thoughtful consideration of fisheries management reform in its bill and subsequent input to the Senate bill. The House should build on and strengthen the Senate bill to reflect the full suite of fisheries management principles articulated by the Joint Initiative and work with the Senate to make reauthorization of the Magnuson-Stevens Act a reality this year.
New Funding for Ocean Policy and Programs	F	Funding for essential ocean programs, outlined above, remains woefully insufficient and is far outpaced by current and future challenges. Failure to provide even the modest funding increases recommended by the Commissions, compounded by funding rescissions in important ocean programs, jeopardizes the economic and ecological benefits our nation receives from its oceans and coasts. New investment must be made so that we can address ocean and coastal issues effectively.

www.jointoceancommission.org

Working Among Agencies

Committee on Ocean Policy
Chair: CEQ
Members: As Identified in Executive Order (Cabinet Level)

Expanded ORAP

Interagency Sub-Committee on Ocean Science and Resource Management Integration
Chair: OSTP, CEQ

NSC PCC Global Environment Chair NSC

23!

NSCT Joint Sub-Committee on Ocean Science & Technology JSOST
Chairs: OSTP, Agencies
Halpern, Leinen, Spinrad

Sub-Committee on Integrated Management of Ocean Resources SIMOR
Chair: CEQ/Agency
Onley, Glackin, Regas

Current EGT Activities and Coordination

- Defining the Seven Characteristics
- Developing Ecosystem Indicators
- Advancing Regional Collaborations
- Initiating Cross-Goal and Cross-program Collaborations
- Partnering with IOOS
- Developing Reauthorization Strategies for various legislation
- Leading Programs Involved in Gulf Rebuilding

EGT Recommendations

Key strategic directions for the EGT for FY09-13 include:

- Regional Coordination of Ecosystem Science & Management
- Integrated Ecosystem Assessments
- Gulf of Mexico Coordination/Development of Hazard-Resilient Ecosystems and Communities

Conclusions & Suggested Actions

- ***Need to invest local, national, and international management venues with similar or complementary principles for management.***

- ***One strategy we can use is to develop a standard definition, objectives and requirements into the reauthorization of federal (and state) legislation: e.g.,***
  - ***Magnuson Stevens FCMA***
  - ***Coral Reef Protection Act***
  - ***Marine Sanctuaries Act***
  - ***MMPA, ESA others…***

- ***Science venues such as IOOS: need to provide a coordinated vision and investments for monitoring & research for Ecosystem Goods and Services (e.g., PaCOOS, Regional Associations…)***

- ***Our community must do a better job of explaining what ecosystems are and what specific outcomes will result from EAM – a Communication strategy is essential***